CRITICAL AREAS REGULATIONS
ADMINISTRATIVE RULE

CODE ISSUE: Bog Identification Method	Chapter 30.91B
CODE CITATION(S): 30.91B.170	

Use the following key for bog/fen determinations [from the Forest Practices Board Manual Section 8 Part 5].

Part 5 Bog Identification

Bogs and nutrient poor fens are distinct wetland types that are very sensitive to disturbance. Bogs and fens form when organic material accumulates in a wetland setting faster than it decomposes. These systems, however, form extremely slowly, with the organic soils forming at approximately one inch in 40 years in Western Washington, and even slower in Eastern Washington.

Bogs and nutrient poor fens are generally acidic and low fertility for plants. Plants growing in these sensitive wetlands are specifically adapted to such conditions, and are usually not found, or uncommonly found, elsewhere. Thus, minor changes in the water regime or nutrient levels in bogs may cause major changes in the plant community. Bogs, and their associated acidic peat environment, provide a habitat for many unique and specialized species of plants and animals. It is not currently possible to construct or restore bogs. The environment is too complex and it takes centuries for the peat to accumulate. We have no examples of successful bog restoration or creation.

Bogs and nutrient poor fens in Washington state can be either open or forested. Open bogs are dominated by short, emergent vegetation that rarely exceeds six feet in height in western Washington and three feet in eastern Washington. The ground is usually very spongy and covered with Sphagnum moss. Some open bogs will actually be floating on top of a small lake or pond and have open water underneath. Open bogs may contain stunted individual trees of sitka spruce, western red cedar, western hemlock, lodgepole pine, western white pine, aspen, Engelmann's spruce, or crab apple.

Forested bogs are harder to identify. These contain mature, full-sized trees of sitka spruce, western red cedar, western hemlock, lodgepole pine, western white pine, Engelmann's spruce, or aspen. The characteristics which typically identify these forests as bogs are a layer of Sphagnum moss and deep organic soils. Also, the ground often feels spongy and is frequently saturated with water even during the dry season. The Sphagnum may not be easily seen, especially if there are pools of standing water in the forest or it is covered by litter. Forested bogs may also have a ground cover of salal or other upland species growing from hummocks or downed logs giving the area the superficial appearance of an upland forest. One often has to look under the ground cover and in pools of standing water to determine whether Sphagnum is present.

Identifying bogs can be challenging, particularly in a forested setting. It is necessary to confirm the presence of organic soils by digging soil pits and it requires the identification of plant species. It may also be difficult to determine the boundaries of a bog. In many cases it may be necessary to ask for the assistance of a wetlands specialist. The Departments of Natural Resources and Ecology have staff available to assist with bog identification. The following key was developed as a guide to help in the identification of

bogs.

Forest Practices Bog Identification Key

	Question	Resp	Action
1.	Area is dominated by mosses, low grass-like or shrubby vegetation, in 1/4 acre or more.	Yes No	Go to 4. Go to 2.
2.	Area has a mixture of stunted trees (sitka spruce, western hemlock, western red cedar, lodgepole pine, Engelmann's spruce, western white pine, aspen or crab apple) and low vegetation in 1/4 acre or more.	Yes No	Go to 4. Go to 3.
3.	Area is forested with sitka spruce, western red cedar, western hemlock, lodgepole pine, quaking aspen, or western white pine, WITH Sphagnum moss as a dominant ground cover (> 30% coverage of the ground) within at least 1/4 acre of the wetland.	Yes No	Go to 4. **Is not a bog.**
Note: A 30% cover of Sphagnum in 1/4 acre means that 30% of the ground within an area of 1/4 acre is shaded by Sphagnum if a light were placed directly over the vegetation. The Sphagnum may be found under a cover of other emergent or shrub vegetation, and at the bottom of temporary pools during the wet season.			
4.	Area has organic soils, either peats or mucks, deeper than 16 inches. Organic soils are defined as follows based on the information in *Soil Taxonomy* (1992):	Yes No	Go to 6 Go to 5
(a) soils with an organic carbon content of 18%			

or more (excluding live roots) if the mineral fraction contains more than 60% clay;
(b) soils with an organic carbon content of 12% if the mineral fraction contains no clay;
(c) soils with an organic carbon content between 12-18% based on the percentage of clay present (multiply the actual percentage of clay by 0.1 and add to 12%).

It is not usually necessary, however, to do a chemical analysis of the soil to determine if a soil is organic. Organic soils are easy to recognize as black-colored mucks or as black or dark brown peats. Mucks feel greasy and stain fingers when rubbed between the fingers. Peats have plant fragments visible throughout the soil and feel fibrous. Many organic soils, both peats and mucks, may smell of hydrogen sulfide (rotten eggs).

5.	Area has organic soils, either peats or mucks, that are less than 16 inches deep over bedrock or hardpan.	Yes No	Go to 6. Is not a bog.
6.	More than 30% of the total plant cover is provided by one or more of the species listed in Table 8.1. Total cover is estimated by assessing the area of land covered by the shadow of plants if the sun were directly overhead.	Yes No	**Is a bog.** **Is not a bog.**

NOTE: Forests may contain several layers of plants that cover the ground. In arriving at the 30% minimum cover look at plants in the "canopy", the "understory", and the "groundcover". You are trying to determine whether the total "footprint" of plants listed in Table 8.1, be they canopy, understory, or groundcover, is more than 30%.

Table 8.1
Characteristic bog species in Washington State

Andromeda polifolia	Bog rosemary
Betula glandulosa	Bog birch
Carex brunescens	Brownish sedge
Carex buxbaumii	Brown bog sedge
Carex canescens	Hoary sedge
Carex chordorhiza	Creeping sedge
Carex comosa	Bearded sedge
Carex lasiocarpa	Wolly-fruit sedge

Carex leptalea	Bristly-stalk sedge
Carex limosa	Mud sedge
Carex livida	Livid sedge
Carex paupercula	Poor sedge
Carex rostrata	Beaked sedge
Carex saxatilis	Russet sedge
Carex sitchensis	Sitka sedge
Carex interior	Inland sedge
Carex pauciflora	Few-flower sedge
Cladina rangifera	reindeer lichen
Drosera rotundifolia	Sundew
Eleocharis pauciflora	Few-flower spike rush
Empetrum nigrum	Black crowberry
Eriophorum chamissonis	Cottongrass
Eriophorum polystachion	Coldswamp cottongrass
Fauria crista-galli	Deer-cabbage
Gentiana douglasiana	Swamp gentian
Juncus supiniformis	Hairy leaf rush
Kalmia occidentalis	Bog laurel
Ledum groenlandicum	Labrador tea
Lysichitum americanum	American skunk cabbage
Malus fusca	Pacific crabapple
Menyanthes trifoliata	Bog bean
Myrica gale	Sweet gale
Pedicularis groenlandic	Elephant's-head lousewort
Picea engelmannii	Engelmann's spruce
Picea sitchensis	Sitka spruce
Pinus contorta	Lodgepole pine
Pinus monticola	Western white pine
Platanthera dilatata	Leafy white orchid
Populus tremula	Quaking aspen
Potentilla palustris	Marsh cinquefoil
Pteridium aquilinum	Bracken fern
Rhynchospora alba	White beakrush
Salix commutata	Under-green willow
Salix eastwoodiae	Mountain willow
Salix farriae	Farr willow
Salix myrtillifolia	Blue-berry willow
Salix planifolia	Diamond leaf willow
Sanguisorba officinalis	Great burne
Sphagnum spp.	Sphagnum mosses
Spiranthes romanzofianna	Hooded ladies'-tresses
Thuja plicata	Western red cedar
Tofieldia glutinosa	Sticky false-asphodel

Tsuga heterophylla	Western hemlock
Vaccinium occidentale	Western huckleberry
Vaccinium oxycoccus	Bog cranberry

NOTE: Latin names and spelling are based on the U.S. Fish and Wildlife Service, "National List of Plant Species that Occur in Wetlands: Washington". Biological Report May 1988. NERC-88/18.47.

RELATED REGULATIONS/POLICIES:

ISSUE RAISED BY:

INTERPRETATION PREPARED BY: R. Middaugh	DATE: 1/04/02
APPROVED BY PLANNING MANAGER:	DATE:
APPROVED BY LAND USE MANAGER:	DATE:
APPROVED BY DIRECTOR:	DATE:

Note: This interpretation is a staff determination only and may be modified during or after the permit hearing process by the Snohomish County Hearing Examiner, the Snohomish County Council, or a court of law.

AUTHOR'S COMMENTS (include applicability to other situations):